

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
Land Division  
Honolulu, Hawaii 96813

January 11, 2008

Board of Land and Natural Resources  
State of Hawaii  
Honolulu, Hawaii

PSF: 00HD-488

KAUAI

Approval of the University of Hawaii, College of Tropical Agriculture and Human Resources Long-Range Plan for the Kamuela Agricultural Experiment Station, Lalamilo, Waimea, South Kohala, Hawaii, Tax Map Key: (3) 6-6-03: 6

At its July 28, 2000 meeting, under agenda item D-17, the Board approved, as amended, the cancellation of Governor's Executive Order No. 2024. Governor's Executive Order No. 2024, dated April 16, 1962, set aside 15.855 acres to the University of Hawaii (University) for the Kamuela Agricultural Experiment Station (also referred to as the Lalamilo Agricultural Experiment Station). A map showing the site is attached as Exhibit A.

The Board also authorized the fee simple conveyance of the 15.855 acres to the University under the condition that the University submits, for approval by the Board, a long-range plan for the use of the subject property within three years of the July 28, 2000 meeting. A long-range plan covering the Lalamilo Agricultural Experiment Station, dated April 8, 2002, was submitted to the Department by the University and is attached as Exhibit B. A more in depth long-range plan for the subject property, dated October 16, 2006, was also submitted by the University and is attached as Exhibit C.

The University requested the fee simple title to the subject property in order to accommodate a request by the Kanu O Ka Aina New Century Public Charter School (Charter School) for the use of a portion of the improvements to conduct classes. To allow the Charter School's use of a portion of the subject property while under the operation of Governor's Executive Order No. 2024 would jeopardize the University's occupancy of the property. The executive order states "... the lands herein set aside shall be used for experiment station purposes only. Should the land herein described be ... used for purposes other than that permitted herein, this executive order shall automatically terminate ..."

Currently, the Charter School occupies a portion of the subject property under a right-of-entry permit issued to the school by the Department. The right-of-entry permit will terminate when the subject property's fee simple title is conveyed to the University.

RECOMMENDATION:

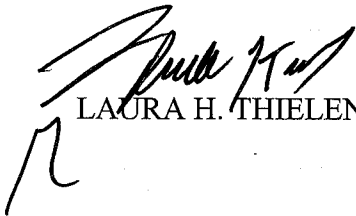
That the Board approve the University of Hawaii Lalamilo Agricultural Experiment Station long-range use plan, dated April 8, 2002, and supplemented on October 16, 2006.

Respectfully Submitted,



Gary Martin, Land Agent

APPROVED FOR SUBMITTAL:

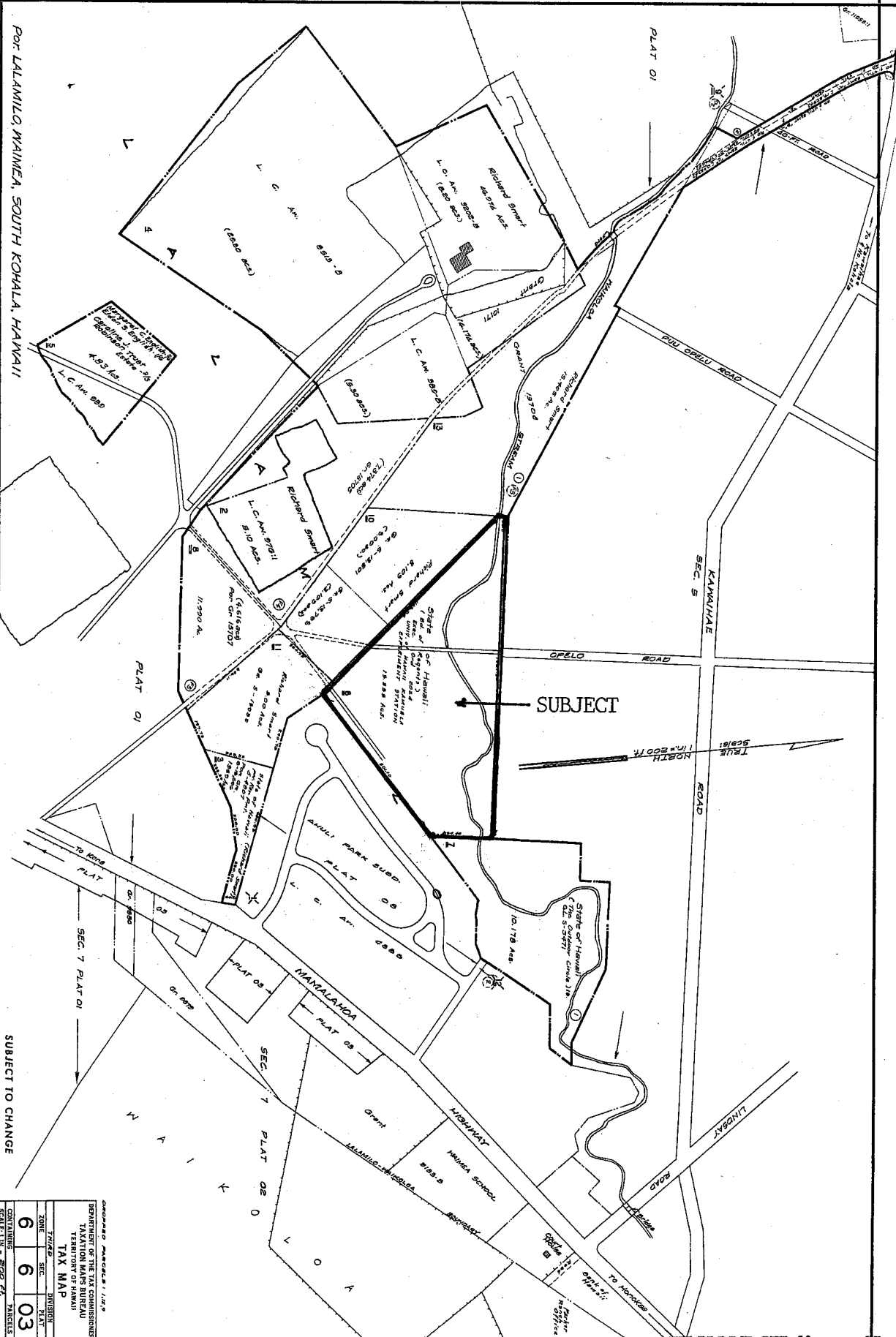


LAURA H. THIELEN, Chairperson



DWG. NO. 2479 (Revised August 1955)  
 SOURCE: Survey Dept. Map by Stanley Wright  
 BY: T.H.U.S. Date: August 10, 1955

POR LALAMILA, MAINEA, SOUTH KOHALA, HAWAII



CONTAINS	6	6	03
SCALE	1" = 200 FT.		
DEPARTMENT OF THE TAX COMMISSIONERS			
TAXATION MAPS BUREAU			
TAX MAP			
ZONE	6	6	03
SECTION	6	6	03
PLAT	6	6	03

EXHIBIT "A"

LONG RANGE PLAN -- LALAMILO EXPERIMENT STATION  
COLLEGE OF TROPICAL AGRICULTURE AND HUMAN RESOURCES  
UNIVERSITY OF HAWAII AT MANOA

April 8, 2002

Background Information:

The Lalamilo Experiment Station is located in one of the State's largest vegetable growing areas where cool season vegetable crops such as lettuce, cabbages, cole crops, celery and gobo are produced. It's cool, dry climate and deep soil is unique to Lalamilo and not found at any other experiment stations on the Big Island. Because it is located in the Lalamilo Agricultural Park, it serves as a site for testing and evaluation of many cultivars of existing and new crops for the farmers located in the area. Several crops including carrots, sweet corn, watermelon, zucchini, cucumber, asparagus, buckwheat, broccoli, cabbage, soybeans, lettuce, cantaloupe, and honey dew melon have been evaluated at the experiment station.

Location and Physical Data:

**TMK:** 6-6-03:06

**Physical address:** 66-1170 Opelo Road

**Mailing Address:** P.O. Box 1719, Kamuela HI 96743

**Elevation:** 2,400 ft.

**Annual rainfall:** 50 inch

**Area:** 15.855 acres total, 5 acres not usable because of stream.

**Climate:** Cool, dry

**Soil:** Waimea Series: Waimea very fine sandy loam, Avg. soil temp. 59 – 62°F

**Infrastructure:** 1 office/workshop (2,250 ft<sup>2</sup>), 1 garage with storeroom (1,152 ft<sup>2</sup>), 1 cottage, and 1 Conley greenhouse (1,500 ft<sup>2</sup>)

**Personnel:** Sent from Mealani Experiment Station as needed

**Equipment:** 2010 John Deere Tractor, 2 plows, 2 disk harrows, 1 drag rake, 1 Rhino Flail mower

**Water:** County water

Present use of the Lalamilo Experiment Station:

1. Experimental plots at the Lalamilo experiment station are currently being used to evaluate the effectiveness of the Area-wide Fruit Fly Integrated Pest Management (IPM) Project. This multi-million dollar project is federally funded and is utilizing the Lalamilo area to demonstrate the feasibility of growing watermelon and cantaloupes – a relatively new crop with high market potential for this area. The latest statistics show Hawaii imported 8.8 million pounds of cantaloupe and 2.8 million pounds of watermelon in 2000 (Statistics of Hawaiian Agriculture 2000). IPM programs teach growers how to maintain disease and insect populations at low levels (economic threshold) with minimal pesticide use to: 1) prevent the development of insecticide resistance and 2) reduce chemical exposure to workers, consumers and the environment. The program integrates field surveys, biorational insecticides (safe for beneficial insects), field sanitation, insect lures, crop rotations, etc. The

Lalamilo Research Station is serving an essential role in this project by having untreated control plots established to compare the effectiveness of the IPM program. Most farmers will not allow this due to fear that insect and disease may spread to adjoining production fields.

2. In addition to the IPM studies, several variety trials are being conducted to evaluate various cultivars of cabbage, watermelon, asparagus, cucumber and corn for yield, insect and disease resistance, taste and shelf-life. This type of applicable research is essential for growers to remain competitive in today's market. The station is also being used to determine the feasibility of producing buckwheat in Hawaii. Buckwheat is high in nutrients especially protein, and commonly ground into flour.
3. Trials are being conducted to determine optimum irrigation rates and to evaluate various foliar fertilizers for use on lettuce, tomatoes and celery.
4. A significant amount of University of Hawaii vegetable seeds (1,342 lbs soybeans and 1,475 lbs super sweet corn) were produced over the past year (2000-01) at Lalamilo. University of Hawaii varieties were bred and selected especially for Hawaii's climate and pest problems. For example, unlike corn varieties available on the Mainland, CTAHR's supersweet corn was bred with tight husk to prevent the corn ear worm from boring through the side of the ear. This allows growers to eliminate pesticide applications as long as the top of the ear is removed. The seeds are available to growers State-wide and distributed through the University of Hawaii at Manoa Agricultural Diagnostic Service Center.
5. The Lalamilo Research Station recently was used to grow a special variety of pumpkin for the maintenance of a culture of the pink peach scale. Attempts to grow the pumpkin at Waiakea and the Kona Research Stations were unsuccessful. It was probably a combination of having the right environmental conditions and personnel that made it successful. This success allowed CTAHR and USDA researchers to conduct laboratory experiments on this serious pest of papayas and other crops. Without this ability to raise the pink peach scale, the research on how best to manage it would not have been able to proceed.
6. The cottage and 2/3 of the office workshop building is temporarily being used by the charter school Kanu O Ka aina. CTAHR decided to partner with this charter school because it believed in the goals and vision of the school who was without a site 40 days before schools opening. Although it's presence is affecting our activities on the station, we felt it was a small price to pay to insure the success of this school.

### CTAHR's Long-range plan for the Lalamilo Experiment Station:

After the September 11 terrorist attack on the World Trade Center Hawaii's government and business leaders have come to realize Hawaii's economy can no longer depend solely on its tourism industry. Diversified agriculture and agricultural research (i.e. pesticide registrations, market development, etc.) is more important than ever. CTAHR is committed to service local growers and the community by continuing to support applicable research (variety trials, pesticide registrations, fertilizer trials, irrigation trials) and seed production projects such as those presently conducted at the Lalamilo station. A new lexan green house that will be used for drying seed is scheduled for construction later this year. CTAHR's researchers and extension agents have also proposed to use the Lalamilo experiment station to evaluate new crops for Waimea farmers such as green tea, wasabi, blueberries, ohelo berries, Palauan taro hybrids, various Asian vegetables and turf grass. Although these commodities are labor intensive they are highly sought after in local and world markets. This gives the small family farmer the opportunity to develop nitch markets.

Hawaii's \$16 million (Statistics of Hawaiian Agriculture 2000) papaya industry is being hard hit by the devastating papaya ring spot virus. The United States Department of Agriculture (USDA) in partnership with CTAHR will be installing a planting of various species and crosses of *Carica* (papaya) for the purpose of regenerating seeds of each selection for the purpose of preserving each of the genetic lines. Because of the prevalence of papaya ringspot virus (PRSV) in other areas of the Big Island and the lack of the virus in the Waimea area, this valuable *Carica* germplasm can be grown with minimum concern of the planting being devastated by the PRSV. CTAHR also has opened its doors to private and government research organizations and educational institutions. These resources remain untapped and may bring new technologies and investment into Hawaii.

### Impact to Hawaii's growers and consumers if station is lost:

1. Hawaii's farmers may face a shortage of UH seed such as the famous Super sweet corn.
2. Finding alternative sites for producing disease-free seeds or preserving genetic lines for papaya will increase production cost for growers and decrease profits.
3. Variety trials needed to evaluate cultivars for yield, insect and disease resistance and shelf-life cannot be conducted.
4. Alternative crop research cannot be conducted.
5. Closure will impact insecticide and fungicide registrations for many vegetable crops.
6. Researchers cannot conduct trials that may attract out of state investors.
7. On farm demonstrations for growers cannot be conducted.
8. IPM programs for the Lalamilo area cannot be developed.

LALAMILO RESEARCH STATION  
CURRENT RESEARCH AND LONG TERM USE PLAN  
COLLEGE OF TROPICAL AGRICULTURE AND HUMAN RESOURCES  
UNIVERSITY OF HAWAI'I AT MĀNOA  
October 16, 2006

Background Information:

The College of Tropical Agriculture and Human Resources (CTAHR) research station system is a unique and valuable resource of the University of Hawai'i and the State of Hawai'i. In addition to conducting applicable research under Hawai'i's diverse climatic and soil conditions the research stations enable CTAHR researchers to conduct long term research as well as research to respond in a timely manner to new problems Hawai'i's growers encounter. CTAHR's Lalamilo Research Station is located in one of the State's largest vegetable growing areas where cool season vegetable crops such as lettuce, cabbages, cole crops, celery and gobo are produced. Its cool, dry climate and deep soil is unique to Lalamilo and not found at any other experiment station on the Big Island. Because it is located in the Lalamilo Agricultural Park, and easily accessible by the community, the Lalamilo station serves as a site for demonstrations, testing and evaluation of many cultivars of existing and new crops for the farmers located in the area. Several crops including carrots, sweet corn, pumpkin, zucchini, cucumber, asparagus, buckwheat, broccoli, cabbage, soybeans, lettuce, cantaloupe, watermelon, strawberries and honeydew melon have been evaluated at the experiment station. The station has also produced and processed a significant quantity of vegetable seed for vegetable growers throughout Hawai'i. Currently, there are eight active research projects at Lalamilo focusing on taro, papaya, lettuce, protea, blueberries, tea, pasture legumes (Barrel Media) and koa (attachment 1). Due to a labor shortage, the station does not have a dedicated staff but labor is sent from the Mealani Research Station on an *as needed* basis.

In June of 1996, CTAHR convened an experiment station review committee. The committee rated Lalamilo as a "low priority station" citing minimal utilization and urban encroachment as its justification. The same report however, stated the following, "This station has a good record for serving the community and the state with research results on irrigation and vegetable cultural practices". In July 2005, given the history of accomplishments, existing infrastructure and minimal input required for maintaining the station, CTAHR Dean Andrew Hashimoto and former county administrator, Dr. Wayne Nishijima decided to keep the Lalamilo station open. The current facilities at Lalamilo are in fairly good condition and include a manager's cottage, field office, warehouse, and greenhouse.

In June of 2000, a request from Kanu 'O Ka Aina New Century Public Charter School was sent to then University of Hawai'i President Kenneth Mortimer to use Lalamilo Research Station as a temporary site for the new Charter School. The University of Hawai'i and CTAHR decided to partner with the charter school because we felt the Station could support the goals and vision of the school, which was due to open in 40 days without a site. The school currently occupies the cottage and 2/3 of the office/workshop building and the area surrounding these buildings. Although its presence is affecting our activities on the station, the College felt it was a small

price to pay to insure the success of this school in a show of support for the community. However, Governor Executive Order 2024 which granted lands to establish the Lalamilo Research Station, stipulated the land **must** be used for agricultural research purposes only. In August of 2005, executive order 2024 was cancelled by executive order 4115. The intention of the cancellation was to convey the land in fee to the University of Hawai'i (attachment 2). The land has not yet been transferred to the University which has led to some uncertainty and commitment by researchers to install long term projects. In addition, completion of the Waimea Trails and Greenways (WTG) project will eventually allow the public to walk or bike on the North border of the station. During the planning phase, it was agreed between CTAHR and WTG project consultant Kaz Shigezawa, (Landscape Images Inc., Kailua-Kona) a chain-link fence would be erected and proper signage posted at WTG expense. This is necessary to prohibit trail users from entering CTAHR's experimental fields. Unauthorized access will compromise the accuracy of our data and increase our liability. Unfortunately, the WTG website, (<http://www.ahualoa.net/wtg/status.html>) stated the following: "As of January 2006, the State of Hawai'i has indicated their willingness to allow the County (and hence the Trail) an easement through the land. The County simply has to let the State know where we want our easement!" WTG meeting notes dated November 7, 2005 stated WTG negotiations would be directly with Department of Land and Natural Resources (DLNR) Land Agent, Mr. Harry Yada and not the University of Hawai'i.

In April 2004, the Waikoloa stream clogged and overflowed resulting in severe erosion of the top soil from one of the fields (ca. 1.5 to 2.0 acres). Although the field is no longer suitable for vegetable production, various fruit trees with low-chill requirements will be evaluated in this area.

Diversified agriculture, agricultural research and extension (i.e. pesticide registrations, alternate crop research, market development, etc.) are more important than ever. CTAHR is committed to service local growers and the community by continuing to support applicable research (trials on variety, pesticides, irrigation, and fertilizer) and seed production trials such as those conducted at the Lalamilo station. CTAHR's researchers' and extension agents have proposed to use the Lalamilo Research Station to evaluate new crops for Waimea farmers such as tea, *wasabi*, blueberries, olive, taro, forage legumes, lychee, wax apples, persimmons, ornamental and landscape plants, and various Asian vegetables. Although these commodities are labor intensive they are highly sought after in local, gourmet and world markets. This gives the small family farmer the opportunity to develop niche markets.

**TMK:** 6-6-03:06

**Physical address:** 66-1170 Opelo Road

**Mailing Address:** P.O. Box 1719, Kamuela HI 96743

**Elevation:** 2,400 ft.

**Annual Rainfall:** 50 inch

**Area:** 15.855 acres total, 5 acres not usable because of stream

**Climate:** Cool, Dry

**Infrastructure:** One 3-bay Butler building office/workshop (2,250 ft<sup>2</sup>), 1 garage with storeroom (1,152 ft<sup>2</sup>), 1-3 bedroom cottage, and 1 Conley greenhouse (1,500ft<sup>2</sup>)

**Personnel:** Sent from Mealani Experiment Station as needed



**Equipment:** 2010 John Deere Tractor, 2 plows, 2 disk harrows, 1 drag rake, 1 Rhino Flail mower

**Water:** County water, 6 inch meter.

**Current Active Projects at the Lalamilo Station:**

	Crop
1) Alternative Vegetable and Tea Production Techniques in Hawai'i County	Tea
2) Pacific Basin Tropical Plant Genetic Resource Management	Papaya
3) Increasing Sustainability of Tropical Pasture	Barrel Medic
4) Blueberries as a high value crop for Hawai'i	Blueberry
5) Improving Phosphorus Fertilizer Management	Lettuce
6) Protea Improvement Program	Protea
7) Inoculation of arbuscular mycorrhizal fungi in the Nursery to Improve Early Establishment of Native Hawaiian Trees	Koa
8) Developing Taro as an Alternative Food and Ornamental Crop	Taro

**Identified problems and solutions:**

1) **Problem:** The cancellation of Governor's Executive order 2024.

**Solution:** The Department of Land and Natural Resources (DLNR) has indicated they will transfer the Lalamilo lands back in fee to the University. DLNR should follow through with the letter dated August 5, 2005 (Attachment 2) and transfer title in fee to the University of Hawai'i.

2) **Problem:** The WTG trail will pass on the North border of the Lalamilo station.

**Solution:** CTAHR must be involved with decisions that affect the long term integrity and usefulness of the facility. CTAHR will contact the WTG and DLNR and remind both parties of the negotiated terms specifically the chain-link fence and signage.

3) **Problem:** Security is a problem since the station is not manned and does not have a 24-hr caretaker.

**Solution:** Once the charter school Kanu 'O Ka Aina permanent facility is completed CTAHR plans to enter into a perquisite agreement with one of our employee's. The tenant will be responsible in providing 24-hr security in exchange for use of the farm cottage.

4) **Problem:** The station is in close proximity to homes and an apartment complex.

**Solution:** CTAHR will judiciously utilize pesticides with low mammalian toxicity. Whenever possible an IPM approach will be utilized. IPM programs integrate field surveys, biorational insecticides (safe for beneficial insects, environment and humans), field sanitation, insect lures, crop rotations, etc. to control pests.

5) **Problem:** Existing dry and dusty conditions.

**Solution:** CTAHR will consider putting in longer term projects that will require less tilling of soil. Vegetable crops which require tilling will be planted on the far end of the station away from homes and the apartment complex (see attachment 1).

6) **Problem:** Labor shortage

**Solution:** Projects with significant labor requirements will need to support the project with temporary labor through alternate funding sources. Labor can be coordinated with other research stations and brought in from other stations located on the Big Island. Positions that have been lost through hiring freezes can be filled as the need for manpower increases. Volunteers such as the Master Gardeners and other organizations can assist with the installation and upkeep of demonstration gardens.

### **Long Range Plan for Lalamilo Research Station**

**Vision:** Lalamilo Research Station will be a premier resource representing the cool, dry, high elevation environment of Hawai'i that provides research based information to the agricultural, urban and rural communities of Hawai'i.

**Mission:** Provide resources for agricultural, horticultural, and natural resource workers so they may conduct short and long term scientific research, demonstration plantings, seed production and propagation, and other related work to benefit the people of Hawai'i.

### **Projects at Lalamilo**

#### **1) Protea**

The objective of this project is to breed and select proteas and other related plants for improved characteristics, production and disease resistance for Hawai'i's cut-flower industry. Propagative material of selected plants will be released to growers as they complete evaluation and found to be promising. Current and proposed trials include:

- a. Evaluating UH *Leucospermum* hybrids for their adaptability to cooler, climatic conditions.
- b. Screen *Proteaceae* cultivars for tolerance to *Phytophthora cinnamomi*, a fungus that causes a root rot disease.
- c. Field trials of new cultivars of *Proteaceae* bred on Maui and other potential flowers and foliages for both the cut-stem and landscape industries.
- d. Evaluate seedlings of imported seeds from South Africa.
- e. Field testing new *Anigozanthos* cultivars from RAMM Botanicals, Australia.
- f. Vaselife studies to determine shelf life of cut-stem cultivars.

#### **2) Tea (*Camellia sinensis*)**

The CTAHR research and extension tea project program will continually develop and release new tea cultivars in collaboration with the United States Department of Agriculture, Agricultural Research Service, Pacific Basin Agricultural Research Center, Tropical Plant Genetic Resource Management Unit. Four cultivars, Yabukita, Benikaori, Bohea and Utaka Midori have been released. The goal of this project is to develop a new industry for Hawai'i growers. Current and proposed projects include:

- a. Evaluate various cultivars for quality, yield, insect resistance, disease resistance, etc.
- b. Field trials to determine optimum cultural practices such as pruning, spacing, fertilization.

- c. Evaluate organic production systems.
- d. Cost analysis and encourage the development of niche markets.
- e. Develop a processing method (i.e. harvesting, fermentation, drying, roasting, etc.).
- f. Evaluate various insecticides and fungicides for efficacy and phytotoxicity.
- g. Screen cultivars for insect, mite and disease resistance.

### 3) Blueberry

There has been a increasing interest in blueberry production by Hawai'i growers. Six cultivars (*Sharpblue*, *Misty*, *Biloxi*, *Jewel*, *Emerald*, and *Sapphire*) were evaluated for size, taste, yield, sweetness and seasonal difference at the Mealani Station. These cultivars performed extremely well and will be tested along with additional varieties at the Lalamilo Station. Current and proposed projects include:

- a. Evaluate various cultivars for quality (size, color, brix, shape and taste), yield, insect resistance, disease resistance, seasonality, performance, etc.
- b. Field trials to determine optimum cultural practices such as pruning, spacing, fertilization.
- c. Cost analysis to determine commercial feasibility.
- d. Post-harvest handling and storage.
- e. Evaluate various cultivars under Lalamilo's growing conditions (i.e. soil type, climate, irrigation).
- f. Develop cultural practices such as mulching, use of weed mats, bird protection, harvesting.
- g. Identifying various pest and diseases associated with blueberry production in Hawaii.
- h. Field planting for evaluation of various insecticides and fungicides for efficacy and phytotoxicity.

### 4) Lychee, wax apples, persimmon, olive etc.

Hak Ip and No Mai Tsz are varieties of lychee that produce high quality fruits in China. Unfortunately, when planted at CTAHR's experiment stations located at lower elevations, both have not performed well. Poor flower induction may be the result of the lack of cooler temperatures at low elevations that are required for flower induction, therefore, these varieties will be evaluated at Lalamilo.

Low-chill requiring varieties of apples, peaches and plums have been successfully grown in tropical climates. A limiting factor in producing orchard crops in Hawai'i are fruit flies. An area-wide fruit fly Integrated Pest Management Program (IPM) was demonstrated to be effective against fruit flies at the Lalamilo station. Current and proposed projects include:

- a. Evaluating the performance of Hak Ip and No Mai Tsz lychee in cool climates.
- b. Evaluating the performance of wax apples, olives, persimmons, apples, plums, and other low-chill requiring fruits.

IPM programs teach growers how to maintain disease and insect populations at low levels (economic threshold) with minimal pesticide use to: 1) prevent the development of insecticide resistance and 2) reduce chemical exposure to workers, consumers and the environment. The

program integrates field surveys, biorational insecticides, field sanitation, insect lures, crop rotations, etc. The Lalamilo station played an essential role in the area-wide IPM project and may be successful in bringing threshold levels low enough to produce traditionally temperate fruits in our tropical environment.

CTAHR is also interested in evaluating olive production at Lalamilo. However, due to uncertainties in ownership and the length of time and commitment it will take to produce a crop for a thorough evaluation, the project will be placed on hold until land issues are resolved.

#### **5) Papaya and other seed producing projects**

The objective of the Lalamilo seed projects are to 1) preserve genetic lines of commodities that possess certain qualities or traits that may be needed for future breeding improvement studies and 2) produce UH developed seed for Hawai'i growers. Current and proposed projects include:

- a. Production and processing of papaya seeds and maintenance of genetic lines.
- b. Production and processing of UH developed corn and soybean seed for use by Hawai'i growers.

Hawai'i's \$12.4 million (Statistics of Hawai'i Agriculture 2004) papaya industry is being hard hit by the devastating papaya ring spot virus. The United States Department of Agriculture (USDA) in partnership with CTAHR has installed a planting of various species and crosses of *Carica* (papaya) for the purpose of regenerating seed of each selection for the purpose of preserving each of the genetic lines. Because of the prevalence of papaya ring spot virus (PRSV) in other areas of Hawai'i and the lack of the virus in the Waimea area, this valuable *Carica* germplasm can be grown with minimal concern of the planting being devastated by PRSV.

CTAHR also provides a significant amount of University developed seed for Hawai'i's growers. University of Hawai'i varieties were bred and selected especially for Hawai'i's climate and pest problems. For example, unlike corn varieties available on the Mainland, CTAHR's supersweet corn was bred for tight husk to prevent the corn earworm from boring through the side of the ear. This allows growers to eliminate pesticide applications as long as the top of the ear is removed. The seeds are available to growers State-wide and distributed through the University of Hawai'i at Mānoa, Agricultural Diagnostic Service Center.

#### **6) Vegetables and melons**

The Lalamilo station has always been used to evaluate various cultivars of cabbage, watermelon, asparagus, cucumber and corn for yield, insect and disease resistance, taste and shelf-life. This type of research is essential for growers to remain competitive in today's market. Current and proposed trials include:

- a. Fertilizer trials, variety trials, insecticide efficacy and phytotoxicity trials.

CTAHR's researchers and extension agents have also proposed to use the Lalamilo Research Station to evaluate new crops for Waimea farmers such as *wasabi*, *ohelo* berries, Palauan taro hybrids, and various Asian vegetables.

## **7) Pasture legumes and turf grass**

Barrel Medic is a pasture legume that will be tested at the Lalamilo station. It has been tested unsuccessfully at lower elevations (Kona Experiment Station). Legumes increase soil fertility by adding nitrogen to the soil and are ideal for Hawaiian pastures since ranchers rarely supplement their pastures with needed fertilizers to minimize costs. Legumes are also a digestible protein source for cattle. Current and proposed projects include:

- a. Increase the sustainability of mixed pastures in Hawai'i through selection of both drought and aluminum tolerant legumes.
- b. Investigate the use of barrel medic to increase soil fertility.
- c. Investigate the use of barrel medic for cattle forage

## **8) Native trees**

The overall objective of this project is to improve early growth and establishment of native Hawaiian forest species through the use of beneficial arbuscular mycorrhizal. Mycorrhizal fungi form a symbiotic relationship with the host plant it infects. The fungi hyphae colonize the root of the host and utilizes its host carbohydrates while the tremendous surface area of the fungi mycelium aid the host by absorbing nutrients such as phosphorous that would otherwise be unavailable. The successful use of mycorrhizal fungi would greatly reduce cost and increase success in native reforestation efforts.

- a. Determine the effect of pre-inoculation of koa with the Hawaiian strain of *Glomus aggregatum*.
- b. Determine the mycorrhizal dependence of Hawaiian tree species not previously studied, such as olapa (*Cheirodendron trigynum*), kawau (*Ilex anomala*), kolea (*Myrsine lessertiana*), milo (*Coprosma ochracea* and *C. rhynchocarpa*), and naio (*Myoporum sandwicense*).
- c. To isolate arbuscular mycorrhizal fungi that form successful associations with koa or other native Hawaiian trees under acid soil conditions.

## **9) Windbreaks**

The Lalamilo Research Station is situated in the saddle between Mauna Kea and Kohala mountains and thus under normal trade wind conditions is windy. There is renewed interest in windbreak species because of the development of nearby land for residential development. The Station is thus well suited as a demonstration and test site for different species, planting schemes, and other methods to mitigate wind effects on crop systems, homes, and other situations. Use of native species and "fire resistant" species are also potential parameters that can be examined.

## **10) Urban demonstration gardens**

Lalamilo Research Station will focus on low input, environmentally friendly, sustainable practices to minimize detrimental impacts on neighboring areas. An urban garden demonstration section will be established to demonstrate science-based research in areas such as sustainable weed and pest control methods, low chill temperate fruits, new vegetable and ornamental varieties, low water requiring and fire resistant plants, and provide hands-on educational

workshops to farmers, students, and homeowners. Researchers and station personnel are expected to work closely with Cooperative Extension personnel, volunteers, and community groups.

**Impact to Hawai'i's growers and consumers if the Lalamilo station is lost:**

1. Hawai'i's farmers may face a shortage of UH developed vegetable seeds such as sweet corn and soybeans and propagative material such as tea and protea cuttings.
2. Finding alternative sites for producing disease-free seed or preserving genetic lines for papaya will increase production cost for growers and decrease profits.
3. Variety trials needed to evaluate cultivars for yield, insect and disease resistance and shelf-life cannot be conducted.
4. Alternative crop research such as tea, wax apples, lychee, persimmons, protea, and blueberries cannot be conducted.
5. Alternative crop research such as identifying exotic fruits or gourmet vegetables suitable for planting in the Lalamilo Agriculture Farm Lots area cannot be conducted.
6. Insecticide and fungicide efficacy and phytotoxicity trials cannot be conducted therefore, limiting registrations for growers.
7. Researchers cannot conduct trials that may attract out-of-state investors.
8. On farm demonstrations, field days, work shops, and conferences for students, homeowners, and growers cannot be conducted.
9. Response to new problems growers face may not be done in a timely manner.
10. Pasture improvement and forestry projects will be negatively impacted.
11. Evaluation of vegetables, fruits and nuts etc. requiring cool, dry growing conditions cannot be conducted.

**Attachments:**

1. Lalamilo plot plan.
2. Letter from DLNR to UH

Attachment 1. Lalamilo plot plan.

